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Bibliography

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(71) [Applicant]

[Identification Number] 000115108

[Name] Uni Charm Corp.

[Address] 182, Kinsei-cho Shimobun, Kawanoe-shi, Ehime-ken

(72) [Inventor(s)]

[Name] Yamada Yozo

[Address] 125-25, Hongo, Kakegawa-shi, Shizuoka-ken

(72) [Inventor(s)]

[Name] Ishikawa Hideyuki

[Address] 541, Kinsei-cho Yamadai, Kawanoe-shi, Ehime-ken

(72) [Inventor(s)]

[Name] Oba Naoki

[Address] 2-19-2, Chuo, Kakegawa-shi, Shizuoka-ken

(72) [Inventor(s)]

[Name] Takai Hisashi

[Address] 2267-1, Kawanoe-cho, Kawanoe-shi, Ehime-ken

(72) [Inventor(s)]

[Name] Kido **

[Address] 883-1, Mendori-cho, Kawanoe-shi, Ehime-ken

(74) [Attorney]

[Patent Attorney]

[Name] Shirahama Yoshiharu

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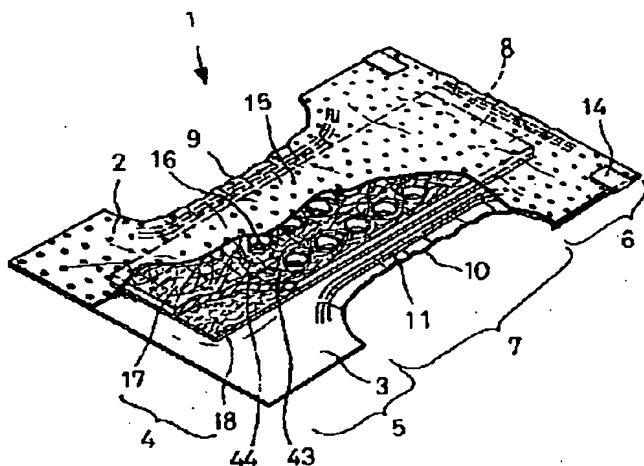
An epitome

(57) [Abstract]

[Objects of the Invention] Puncturing which holds the solid content in body fluid in the absorber of a body fluid processing supply is prepared, and the feeling of wear of this supply is raised.

[Elements of the Invention] Thermoplastic fiber (43) Mixture (10 - 70 % of the weight and absorptivity material (44) 90-30 % of the weight) is supplied on a substrate with which a pin for allocated types stands up, is heated more than softening temperature of thermoplastic fiber (43), the allocated type of this fiber is imitated and carried out to a pin configuration, and an absorber (17) of the shape of a sheet which has puncturing (16) corresponding to a size of a pin, height, and arrangement is obtained. In a body fluid processing supply (1), an absorber (17) is covered and used with a permeable surface sheet (2) which has a bore (15).

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CLAIMS

[Claim(s)]

[Claim 1] It is a permeable surface sheet at least. An absorber which intervenes between an impermeability rear-face sheet and both [these] sheets. It is said body fluid processing supply equipped with the above. Said absorber 10 - 70 % of the weight of thermoplastic fiber with a length [fineness of 2-10 deniers and length] of 5mm or more. It consists of 90 - 30 % of the weight [of absorptivity materials containing one or more kinds of materials chosen from a split of a hydrophilic natural fiber, a rayon fiber, a high absorptivity polymer particle, and a spongy macromolecule] mixture. In a portion which counters said surface sheet, puncturing area has puncturing of 2 by 2 - 70% of hole density 10-2,000mm. It is a sheet-like object with a thickness of 0.5-20mm, and is characterized by puncturing area having a bore of 2 by 10 - 60% of hole density 3-100mm in a portion to which said surface sheet counters said absorber at least.

[Claim 2] A body fluid processing supply according to claim 1 a part of whose

puncturing [at least] of said absorber is a bore.

[Claim 3] A body fluid processing supply according to claim 1 or 2 with which a non-punctured absorber is substantially formed in said absorber at said rear-face sheet side.

[Claim 4] A manufacture method of an absorber used making intervene between permeable surface sheets of a body fluid processing supply and impermeability rear-face sheets which are characterized by providing the following 10 - 70 % of the weight of thermoplastic fiber with a fiber length [fineness of 2-10 deniers and fiber length] of 5-100mm About a web which consists of 90 - 30 % of the weight [of absorptivity materials containing one or more kinds of materials chosen from a split of a hydrophilic natural fiber, a rayon fiber, a high absorptivity polymer particle, and a spongy macromolecule] mixture, it is a puncturing means at least.

[Claim 5] A manufacture method according to claim 4 characterized by said puncturing means forming in said web puncturing which imitates said pin configuration including heating apparatus which can be heated even to predetermined temperature by heating said web more than softening temperature of said thermoplastic fiber in said web on a substrate with which a pin for allocated types stood up at least, and this substrate.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the manufacture method of disposable body fluid processing supplies, such as a disposable diaper, a sanitary napkin, and a body fluid absorption pad for incontinencia, and the absorber used for it.

[0002]

[Description of the Prior Art] Conventionally, a permeable surface sheet, an impermeability rear-face sheet, and the absorber that intervenes among both

[these] sheets may constitute a disposable body fluid processing supply. Sheets plastic, such as polyethylene, are used for puncturing sheets plastic and nonwoven fabrics, such as polyethylene, and a rear-face sheet at a surface sheet, and it has the shape of a thick sheet (the shape of or a panel), and an absorber makes grinding pulp the charge of a principal member, and uses together high absorptivity polymer and thermoplastic fiber if needed. The mixture of grinding pulp and thermoplastic fiber of heat deformation of the thermoplastic fiber being carried out, and an allocated type being carried out to the shape of a sheet by performing heat treatment, for example, heat embossing processing, to this, is well-known, and this **** type technology indicated by U.S. Pat. No. 4,100,324, No. 4,590,114, the No. 5,057,357 official report, etc. is applicable to manufacture of an absorber.

[0003]

[Problem(s) to be Solved by the Invention] Although moisture will pass a surface sheet and will be promptly absorbed if a loose passage and the body fluid which gets down and contains solid content, such as an object, are processed when it is the conventional sheet-like object with which the absorber of a body fluid processing supply consists of mixture of grinding pulp or grinding pulp, and high absorptivity polymer, solid content remains on a surface sheet and has the problem of giving a wearer displeasure.

[0004] So, in this invention, it is making into the technical problem to hold into puncturing of the solid content which passed the bore of an absorber, and to solve said problem by obtaining the body fluid processing supply of wrap structure with the surface sheet which has a bore for the absorber which prepared puncturing. It combines, thermoplastic fiber is mixed to grinding pulp etc., and ** which prepares puncturing in an absorber using heat deformation of this fiber is made into the technical problem.

[0005]

[Means for Solving the Problem] The place made into a summary in order that this invention may solve said technical problem is as follows.

[0006] It is premised on a body fluid processing supply which consists of a permeable surface sheet, an impermeability rear-face sheet, and an absorber that intervenes among both [these] sheets in this invention.

[0007] In this body fluid processing supply an absorber 10 – 70 % of the weight of thermoplastic fiber with a length [fineness of 2–10 deniers and length] of 5mm or more, It consists of 90 – 30 % of the weight [of absorptivity materials containing one or more kinds of predetermined materials, such as a hydrophilic natural fiber,] mixture. In a portion which counters a surface sheet, have puncturing of 2 by 2 – 70% of hole density a puncturing area of 10–2,000mm. It is a sheet-like object with a thickness of 0.5–20mm, and it is the feature of the invention that puncturing area has a bore of 2 by 10 – 60% of hole density 3–100mm on the other hand in a portion to which a surface sheet counters said absorber at least.

[0008] In one of the desirable embodiments, puncturing prepared in an absorber is a

bore which penetrates between table rear faces. Moreover, in other desirable embodiments, a non-punctured absorber is substantially formed in an absorber at the rear-face sheet side.

[0009] In a manufacture method of an absorber concerning this invention 10 – 70 % of the weight of thermoplastic fiber with a fiber length [fineness of 2–10 deniers and fiber length] of 5–100mm, A web which consists of 90 – 30 % of the weight [of hydrophilic materials containing predetermined materials, such as hydrophilic fiber,] mixture It is the feature to make it a sheet-like object with a thickness of 0.5–20mm which has arranged puncturing of 2 to a predetermined puncturing pattern a puncturing area of 10–2,000mm in web down stream processing including a puncturing means.

[0010] In one of the desirable embodiments, puncturing which imitates a pin configuration is formed in the web by heating a web of the shape of a substrate to which a pin for allocated types stands up more than softening temperature of thermoplastic fiber contained in it.

[0011]

[Function] With the body fluid processing supply concerning this invention, the solid content in body fluid passes a bore from a wrap with the surface sheet which has a bore with small puncturing area and hole density for the absorber which prepared puncturing relatively, it holds in puncturing of an absorber, and the held solid content does not flow backwards easily.

[0012] If mixture, such as thermoplastic fiber, is supplied and heated on the substrate with which the pin for allocated types stands up, the absorber of the shape of a sheet which has puncturing which it heat-deformed, or the thermoplastic fiber fused, and imitated the pin configuration can be obtained. By adjusting the height of a pin, and the amount of supply of mixture, the depth of puncturing, the thickness of an absorber, a basis weight, etc. are controllable.

[0013] The obtained absorber can be cut out if needed and can be made into an appearance configuration suitable to each body fluid processing supply.

[0014]

[Example] It is as follows when it explains based on drawing of attachment of the details of this invention.

[0015] Drawing 1 and drawing 2 are the perspective diagram in which fracturing the disposable diaper 1 concerning this invention in part, and showing it, and the partial expansion perspective diagram of the absorber 4 used for it. A diaper 1 consists of the permeable surface sheet 2, the impermeability rear-face sheet 3, both sheets 2, and an absorber 4 that intervenes among three, and both the sheets 2 and 3 of each other are densely joined in the diaper 1 perimeter. the cross direction of a diaper 1 – past time – 5 and later self – time – both 6 and body time – between 5 and 6 – intervening – length from the crotch to the cuff – a part – seven – constituting – having – later self – time – 6 – the elastic member 8 elongated in the direction of the circumference of the waist is stuck on the edge between both

the sheets 2 and 3, and the tape-like fastener 14 is formed in the left right-hand side edge. The length-from-the-crotch-to-the-cuff part 7 prepares notching which curved on right-and-left both sides, and has made it the circumference bend 10 of a foot, and the circumference elastic member 11 of a foot elongated in the 5 and 6 direction to the inside at the order body time is stuck between both the sheets 2 and 3.

[0016] The surface sheet 2 is a polyethylene sheet with a thickness of 30 microns, and the bore 15 of about 4mm of apertures which penetrate the thickness direction was distributed uniformly [hole density] at about 15% except for a part for a joint with the rear-face sheet 3, and has brought water permeability to the surface sheet 2. An absorber 4 consists of a surface absorber 17 with an appearance thickness of 15mm which has puncturing 16, and a rear-face absorber 18 which is not punctured [which carried out the laminating to the rear-face side / with an appearance thickness of 5mm], and is made into the vertical x horizontal =400x130mm rectangle. puncturing 16 is a bore of about 10mm of apertures, and narrow in the circumference bend 10 of a foot on either side — it is distributed over the ***** part 7 at 25% of hole density. As an absorptivity material 44, including 40 % of the weight of grinding pulp, and 15 % of the weight of high absorptivity polymer powder, it is the mixture which contains 45 % of the weight of side-by-side mold bicomponent fibers of the polyethylene/polypropylene of the fineness of 4 deniers, and 25mm of mean fiber length as thermoplastic fiber 43, and the surface absorber 17 has the basis weight of 400g/m², is heat-treated with the softening temperature of polyethylene, and a bicomponent fiber carries out curliness of it, and each other is carrying out the confounding. The rear-face absorber 18 is the basis weight of 10g/the sheet-like object of m² which mixed 10 % of the weight of high absorptivity polymer powder with 90 % of the weight of grinding pulp, and was compressed, and although it has a gap between fiber, there is no puncturing like puncturing 16 and it can say no puncturing substantially. The rear-face sheet 3 is a polyethylene sheet with a thickness of 50 microns, the material of common use is used for the member of others of a diaper 1, and they are assembled with the common use means.

[0017] Thus, the moisture and solid content in body fluid pass a bore 15, moisture is absorbed by a table and the rear-face absorbers 17 and 18, solid content is held in puncturing 16, it decreases that the diaper's 1 constituted body fluid remains on the surface sheet 2, or the held solid content flows backwards, and its feeling of wear improves. Such improvement is similarly obtained in not only when a body fluid processing supply is a diaper 1, but the body fluid absorption pad for incontinencia, or a sanitary napkin. The bore 15 of the surface sheet 2 is formed to these body fluid processing supplies in the portion which counters an absorber at least in the puncturing area 2 and the range of 10 – 60% of hole density of 3–100mm. Although the puncturing 16 of the surface absorber 17 is formed in the portion which counters the surface sheet 2 in the puncturing area 2 and the range of 2 – 70% of hole density of 10–2,000mm, the arrangement may also attain to the whole portion

which counters the surface sheet 2, without restricting to the specific part of length-from-the-crotch-to-the-cuff part 7 grade. It can be made into the bore which penetrates the part or all in the thickness direction, or the foramen cecum ossis forntalis which is not penetrated, and also when it is any, as for puncturing 16, it is desirable to make an aperture larger than the aperture of a bore 15. Puncturing 16 can lead body fluid to puncturing 16 promptly by the capillary action by the fiber, if the fiber which constitutes the surface absorber 17 and the rear-face absorber 18 existed somewhat and it has faced into it at the bore 15 rather than it is an entire cavity. The rear-face absorber 18 cannot be used for an absorber 4, but it can use it only as the surface absorber 17.

[0018] Drawing 3 and drawing 4 are typical process drawing for manufacturing the surface absorber 17 of drawing 1, and the partial expansion perspective diagram of the endless belt 23 for allocated types used there. At this production process, it moves to the left from the right and becomes a product 30, and the web 20 of a raw material material is suitably judged by the configuration at another production process (not shown), and serves as the surface absorber 17. A production process consists of roll 25 grade for rolling up of the endless belt 21 for web 20 conveyance, the endless belt 23 for allocated types with which the metal pin 22 for allocated types stands up in a predetermined pitch, the heating furnace 24 to which melting of the thermoplastic fiber 43 contained in a web 20 can be carried out softening and if needed, and a product 30. A pin 22 has the maximum part in a height of 0.7-40mm, 10-2,000mm of cross sections has in the range of 2, and it has a necessary cross-section configuration, and is arranged to the endless belt 23 at the predetermined pattern.

[0019] The absorptivity material 44 containing one or more kinds of materials with which a web 20 is 10 - 70 % of the weight, and thermoplastic fiber 43 with a length [the fineness of 2-10 deniers and length] of 5-100mm chose it from ***** of spongy macromolecules, such as a hydrophilic natural fiber, a rayon fiber and high absorptivity polymer particles, such as pulp, and an urethane sponge cellulose sponge, is 90 - 30% of the weight of mixture, and the basis weight is set to 20-500g/m². To the endless belt 23 for allocated types under transit, this web 20 is supplied crosswise [that] in a uniform amount from the endless belt 21 for conveyance. If required [for a web 20] and a pressure is applied in that case after sprinkling little water to a web 20 although few pressures are applied in the thickness direction and conditions are stabilized, you can make it stabilized more certainly. A belt 23 passes the heating furnace 24 of predetermined temperature, a part is fused, it deforms and softening or the deformation which imitates the configuration produces [thermoplastic fiber 43] it in the circumference of a pin 22 in the meantime. Slight planar pressure can be made to be able to act on the whole surface of a web 20 during heating, and thickness of a web 20 can be made into homogeneity using heat deformation of fiber 43. When fiber 43 is heat curliness nature, curliness is made to discover in this heating furnace 24. It cools, and the web

20 which came out of the heating furnace 24 stabilizes a configuration, is sampled from a pin 22, and is taken as a product 30. Products 30 are the size of a pin 22, height, and a sheet-like object that has the puncturing 16 corresponding to a location, and can regulate its thickness and density by the amount of supply to the belt 23 for allocated types of a web 20, the planar pressure made to act if needed. Puncturing 16 is compared with the height of a pin 22, if there is much amount of supply of a web 20, it will turn into foramen cecum ossis forntalis, and if few, it will turn into a bore.

[0020] The desirable examples of the thermoplastic fiber 43 used for a web 20 are bicomponent fibers, such as a sheath-core mold bicomponent fiber of the split yarn and polyethylene which staple-fiber[cleavage and]-ized the complex film of polyethylene and polypropylene, and polypropylene. This seed bicomponent fiber that can carry out curliness with heating has a dense fiber confounding, and although the surface absorber 17 whose configuration was stable is obtained, it is useful. The surface absorber 17 of reinforcement with the fiber length of thermoplastic fiber 43 sufficient by less than 5mm is not obtained, if it becomes longer than 100mm, it will become difficult to sprinkle a web 20 uniformly to the circumference of a pin 22, and the puncturing 16 in which the outline was ready is not obtained. When the amount of the thermoplastic fiber 43 used exceeds 70% on the other hand rather than has the enough reinforcement of an absorber 1 at less than 10%, it is in the orientation for the surface absorber 17 to become hard too much. Although it is also possible to change to the thermoplastic fiber which carried out hydrophilization processing of a part or all of thermoplastic fiber 43, and to serve as some absorptivity materials, since the water holding capacity of an absorber will decline in addition to an absorber becoming hard too much if thermoplastic fiber exceeds 70 % of the weight in the surface absorber 17, it is not desirable. Although water holding capacity is low, it has absorptivity, and spongy macromolecules, such as urethane sponge and a cellulose sponge, are effective in giving cushioning properties to the surface absorber 17 and improving the concordance to a part.

[0021] If it is in the web 20 which is the mixture of hydrophilic fiber with comparatively short fiber, such as grinding pulp, and thermoplastic fiber 43 with comparatively long fiber, the secondary effect of raising the moisture diffusibility between fiber with the thermoplastic short fiber which extends between short fiber is also acquired. The bore 15 of the surface sheet 2 may be ***** which it is the superficial hole prepared in the sheet plastic or the nonwoven fabric, and also extends toward an absorber 4 from the surface of the surface sheet 2. The puncturing area in this case is the projected area to the plane of a ***** point.

[0022]

[Effect of the Invention] With the body fluid processing supply concerning this invention, it is rare for solid content to remain on a surface sheet, or to flow backwards, since the solid content which passed the bore of a surface sheet is held in puncturing prepared in the absorber, and it does not spoil a feeling of wear after

body fluid elimination.

[0023] If the web of a raw material material is supplied and heated and puncturing of an absorber is formed in the circumference of the pin which stood up on the substrate, regardless of whether the puncturing is a bore or it is the foramen cecum ossis forntalis, the necessary depth can be obtained easily. Since a web is not locally pressurized unlike heat embossing as it is this method, it is rare to be hard to produce the unevenness of density or hardness in the absorber obtained, and to spoil the absorptivity ability of a raw material material, and the touch.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The perspective diagram fracturing and showing a part of body fluid processing supply concerning this invention.

[Drawing 2] The partial expansion perspective diagram of an absorber.

[Drawing 3] Typical manufacturing process drawing of an absorber.

[Drawing 4] The partial expansion perspective diagram of the endless belt for allocated types.

[Description of Notations]

1 Body Fluid Processing Supply (Disposable Diaper)

2 Surface Sheet

3 Rear-Face Sheet

4 Absorber

7 Length-from-the-Crotch-to-the-Cuff Part

15 Bore

16 Puncturing

17 Absorber (Puncturing Absorber)

18 Absorber (Non-Punctured Absorber)

20 Web

- 22 Pin
- 23 Substrate (Endless Belt for Allocated Types)
- 24 Heating Apparatus
- 43 Thermoplastic Fiber
- 44 Absorptivity Material

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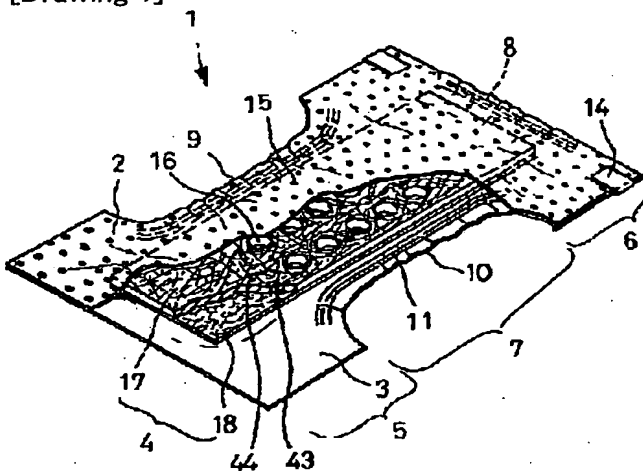
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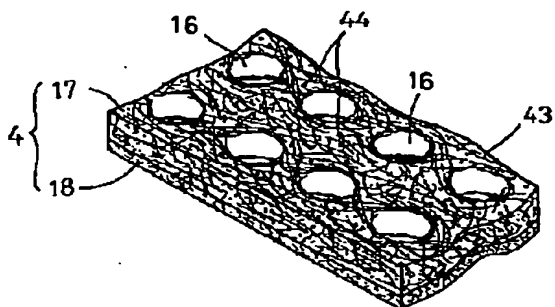
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DRAWINGS

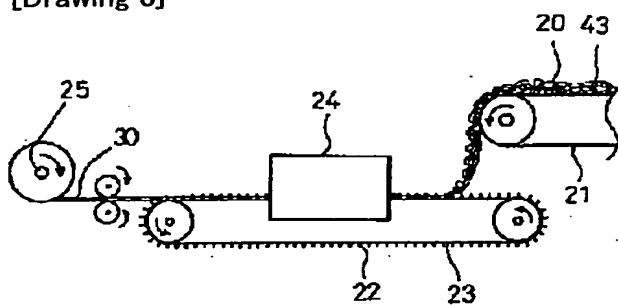
[Drawing 1]



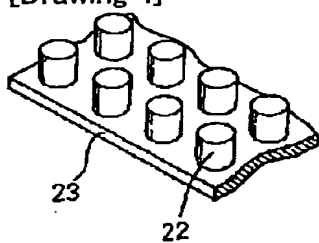
[Drawing 2]



[Drawing 3]



[Drawing 4]



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(71)出願人 000115108

ユニ・チャーム株式会社

愛媛県川之江市金生町下分182番地

(72)発明者 山田 洋三

静岡県掛川市本郷125-25

(72)発明者 石川 秀行

愛媛県川之江市金生町山田井541

(72)発明者 大庭 直紀

静岡県掛川市中央2-19-2

(72)発明者 高井 尚志

愛媛県川之江市川之江町2267-1

(72)発明者 城戸 勉

愛媛県川之江市妻鳥町883-1

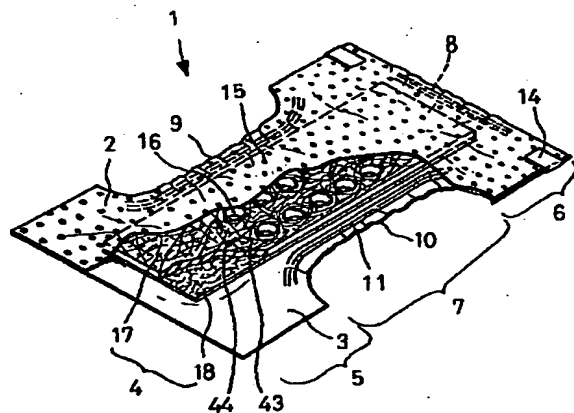
(74)代理人 弁理士 白浜 吉治

(54)【発明の名称】 体液処理用品、およびその吸収体製造方法

(57)【要約】

【目的】 体液処理用品の吸収体に体液中の固形分を収容する開孔を設け、この用品の着用感を向上させる。

【構成】 熱可塑性繊維(43)10~70重量%と吸水性材料(44)90~30重量%との混合物を試型用ピンが起立する基板上に供給し、熱可塑性繊維(43)の軟化温度以上に加熱して、この繊維をピン形状に倣い賦型し、ピンの太さ、高さ、配置に対応した開孔(16)を有するシート状の吸収体(17)を得る。体液処理用品(1)において、吸収体(17)は透孔(15)を有する透水性表面シート(2)で被覆して使用する。



【特許請求の範囲】

【請求項1】少なくとも透水性表面シートと、不透水性裏面シートと、これら両シート間に介在する吸収体とからなる体液処理用品であって、

前記吸収体が、織度2～10デニール・長さ5mm以上の熱可塑性繊維10～70重量%と、親水性天然繊維・レーヨン繊維・高吸水性ポリマー粒子および海綿状高分子の細片から選択した材料を一種以上含む吸水性材料90～30重量%との混合物からなり、前記表面シート

に対向する部分において開孔面積が10～2,000mm²の開孔を2～70%の開孔率で有する、厚さ0.5～20mmのシート状物であり、

前記表面シートが、少なくとも前記吸収体に対向する部分において開孔面積が3～100mm²の透孔を10～60%の開孔率で有することを特徴とする前記体液処理用品。

【請求項2】前記吸収体の開孔の少なくとも一部が透孔である請求項1記載の体液処理用品。

【請求項3】前記吸収体には、実質的に無開孔の吸収体

が前記裏面シート側に設けてある請求項1または2記載の体液処理用品。

【請求項4】体液処理用品の透水性表面シートと不透水性裏面シートとの間に介在せしめて使用する吸収体の製造方法であって、
織度2～10デニール・繊維長5～100mmの熱可塑性繊維10～70重量%と、親水性天然繊維・レーヨン繊維・高吸水性ポリマー粒子および海綿状高分子の細片から選択した材料を一種以上含む吸水性材料90～30重量%との混合物からなるウェブを、少なくとも開孔手段を含む該ウェブ処理工程において開孔面積10～2,000mm²の開孔を所定開孔パターンに配置した厚さ0.5～20mmのシート状物にすることを特徴とする前記吸収体の製造方法。

【請求項5】前記開孔手段が、少なくとも賦型用ピンが起立した基板と該基板上の前記ウェブを所定温度にまで加熱可能な加熱装置とを含み、前記熱可塑性繊維の軟化温度以上に前記ウェブを加熱することにより前記ピン形状に倣う開孔を前記ウェブに形成することを特徴とする請求項4記載の製造方法。

【発明の詳細な説明】

【0001】

【産業上の利用分野】この発明は使い捨ておむつ・生理用ナプキン・失禁用体液吸収パッド等の使い捨て体液処理用品、およびそれに使用する吸収体の製造方法に関する。

【0002】

【従来の技術】従来、使い捨ての体液処理用品を透水性表面シートと不透水性裏面シートと、これら両シート間に介在する吸収体とによって構成する場合がある。表面シートにはポリエチレン等の開孔プラスチックシートや

不織布、裏面シートにはポリエチレン等のプラスチックシートを使用し、吸収体は厚手のシート状（またはパネル状）であって、粉碎バルブを主材料とし、必要に応じて高吸水性ポリマーや熱可塑性繊維を併用する。粉碎バルブと熱可塑性繊維との混合物は、これに熱処理、例えば熱エンボス処理を施すことにより熱可塑性繊維を熱変形させてシート状に賦型し得ることは公知であり、米国特許第4,100,324号、第4,590,114号、第5,057,357号公報等に掲載されたこの種賦型技術は吸収体の製造に利用することができる。

【0003】

【発明が解決しようとする課題】体液処理用品の吸収体が粉碎バルブ、または粉碎バルブと高吸水性ポリマーとの混合物からなる従来のシート状物である場合、軟便や下り物等の固形分を含む体液を処理すると、水分は表面シートを通過して速やかに吸収されるが、固形分は表面シート上に残り着用者に不快感を与えるという問題がある。

【0004】そこで、この発明では開孔を設けた吸収体を透孔を有する表面シートで覆う構造の体液処理用品を得ることにより、透孔を通過した固形分を吸収体の開孔の中に收容して前記問題を解決することを課題にしている。併せて、粉碎バルブ等に熱可塑性繊維を混合し、この繊維の熱変形を利用して吸収体に開孔を設けることを課題にしている。

【0005】

【課題を解決するための手段】この発明が前記課題を解決するために要旨とするところは、以下のとおりである。

【0006】この発明では、透水性表面シートと、不透水性裏面シートと、これら両シート間に介在する吸収体とからなる体液処理用品を前提にしている。

【0007】かかる体液処理用品において吸収体が、織度2～10デニール・長さ5mm以上の熱可塑性繊維10～70重量%と、親水性天然繊維等の所定材料を一種以上含む吸水性材料90～30重量%との混合物からなり、表面シートに対向する部分において開孔面積10～2,000mm²の開孔を2～70%の開孔率で有する、厚さ0.5～20mmのシート状物であり、一方、表面シートが少なくとも前記吸収体に対向する部分において開孔面積が3～100mm²の透孔を、10～60%の開孔率で有することがその発明の特徴である。

【0008】好ましい実施態様の一つにおいて、吸収体に設けた開孔は表裏面間を貫通する透孔である。また、他の好ましい実施態様において、吸収体にはその裏面シート側に実質的に無開孔の吸収体が設けてある。

【0009】この発明に係る吸収体の製造方法においては、織度2～10デニール・繊維長5～100mmの熱可塑性繊維10～70重量%と、親水性繊維等の所定材料を含む親水性材料90～30重量%との混合物からな

るウェブを、開孔手段を含むウェブ処理工程において開孔面積 $10 \sim 2,000 \text{ mm}^2$ の開孔を所定開孔パターンに配置した厚さ $0.5 \sim 20 \text{ mm}$ のシート状物にすることがその特徴である。

【0010】好ましい実施態様の一つにおいて、賦型用ピンが起立する基板状のウェブをそれに含まれる熱可塑性繊維の軟化温度以上に加熱することにより、ピン形状に倣う開孔をそのウェブに形成する。

【0011】

【作用】この発明に係る体液処理用品では、開孔を設けた吸収体を相対的に開孔面積と開孔率とが小さい透孔を有する表面シートで覆うから、体液中の固形分は透孔を通過して、吸収体の開孔に収容され、収容された固形分は容易に逆流することがない。

【0012】賦型用ピンが起立する基板上に熱可塑性繊維等の混合物を供給し、加熱すると、その熱可塑性繊維が熱変形、もしくは溶融してピン形状に倣った開孔を有するシート状の吸収体を得ることができる。ピンの高さおよび混合物の供給量を調整することにより、開孔の深さ、吸収体の厚み、坪量等を規制することができる。

【0013】得られた吸収体は必要に応じて裁断し、それぞれの体液処理用品にふさわしい外形形状にすることができる。

【0014】

【実施例】この発明の詳細を添付の図に基づいて説明すると、以下のとおりである。

【0015】図1および図2は、この発明に係る使い捨ておむつ1を一部破断して示す斜視図と、それに使用する吸収体4の部分拡大斜視図である。おむつ1は、透水性表面シート2、不透水性裏面シート3、両シート2、3間に介在する吸収体4とからなり、両シート2、3はおむつ1周囲において互いに密に接合してある。おむつ1の前後方向は前身頃5、後身頃6、両身頃5、6間に介在する股下部位7によって構成され、後身頃6の端部には腰周り方向に伸張した弾性部材8が両シート2、3間に貼着してあり、左右側縁にはテープ状ファスナー14が設けてある。股下部位7は、左右両側に湾曲した切り欠きを設けて脚周り湾曲部10としてあり、その内側には前後身頃5、6方向に伸張した脚周り弾性部材11が両シート2、3間に貼着してある。

【0016】表面シート2は厚み 30 ミクロン のポリエチレンシートであって、厚み方向を貫通する孔径約 4 mm の透孔15が裏面シート3との接合部分を除いて開孔率が約 15% で一様に分布し、表面シート2に透水性をもたらしている。吸収体4は開孔16を有する見かけ厚み 15 mm の表面吸収体17と、その裏面側に積層した見かけ厚み 5 mm の無開孔の裏面吸収体18とからなり、縦×横 $=400 \times 130 \text{ mm}$ の矩形にしてある。開孔16は孔径約 10 mm の透孔であって、左右の脚周り湾曲部10に挟まれた股下部位7に開孔率 2.5% で分布

している。表面吸収体17は、吸水性材料44として粉碎バルブ40重量%と高吸水性ポリマー粉15重量%を含み、熱可塑性繊維43として織度4デニール・平均繊維長 25 mm のポリエチレン/ポリプロピレンのサイド・バイ・サイド型複合繊維45重量%を含む混合物で、坪量 400 g/m^2 を有し、ポリエチレンの軟化温度で熱処理されて複合繊維が巻縮し、互いに交絡している。裏面吸収体18は、粉碎バルブ90重量%と高吸水性ポリマー粉10重量%を混合し、圧縮した坪量 10 g/m^2 のシート状物であり、繊維間に間隙を有するが開孔16のごとき開孔はなく、実質的に無開孔といえるものである。裏面シート3は厚さ 50 ミクロン のポリエチレンシートであり、おむつ1のその他の部材には慣用の素材を使用し、それらが慣用手段により組み立ててある。

【0017】このように構成したおむつ1は、体液中の水分と固形分とが透孔15を通過し、水分は表・裏面吸収体17、18に吸収され、固形分は開孔16に収容されて、表面シート2上に体液が残ったり、収容された固形分が逆流したりすることが少なくなり、着有感が向上する。そのような向上は、体液処理用品がおむつ1である場合に限らず、失禁用体液吸収パッドや生理用ナプキンにおいても同様に得られる。これらの体液処理用品に対し、表面シート2の透孔15は少なくとも吸収体に対向する部分において開孔面積 $3 \sim 100 \text{ mm}^2$ 、開孔率 $10 \sim 60\%$ の範囲で設ける。表面吸収体17の開孔16は表面シート2に対向する部分において開孔面積 $10 \sim 2,000 \text{ mm}^2$ 、開孔率 $2 \sim 70\%$ の範囲で設けるが、その配置は股下部位7等の特定部位に限ることなく表面シート2に対向する部分全体に及んでもよい。開孔16は、その一部または全部を厚み方向に貫通する透孔、または、貫通しない盲孔にすることができ、いずれの場合にも孔径を透孔15の孔径よりも大きくしておくことが好ましい。開孔16は全くの空洞であるよりも、その中に表面吸収体17や裏面吸収体18を構成する繊維が多少存在し、それが透孔15に臨んでいるとその繊維による毛管作用で体液を開孔16へ速やかに導くことができる。吸収体4は、裏面吸収体18を使用せず、表面吸収体17のみにすることができる。

【0018】図3および図4は、図1の表面吸収体17を製造するための模式的工程図と、そこで使用する賦型用無端ベルト23の部分拡大斜視図である。この工程では、原料素材のウェブ20が右から左へ移動して製品30となり、別工程（図示せず）で適宜形状に裁断されて表面吸収体17となる。工程はウェブ20搬送用無端ベルト21、金属製の賦型用ピン22が所定ピッチで起立する賦型用無端ベルト23、ウェブ20に含まれる熱可塑性繊維43を軟化および必要に応じて溶融させ得る加熱炉24、製品30の巻き取り用ロール25等からなる。ピン22は高さ $0.7 \sim 40 \text{ mm}$ 、断面積はその最大部位が $10 \sim 2,000 \text{ mm}^2$ の範囲にあって所要断

面形状を有し、無端ベルト23に対し所定パターンに配置されている。

【0019】ウェブ20は、織度2〜10デニール・長さ5〜100mmの熱可塑性繊維43が10〜70重量%で、バルブ等の親水性天然繊維・レーヨン繊維・高吸水性ポリマー粒子およびウレタンスポンジ・セルローススポンジ等の海綿状高分子の破細片から選択した材料を一種類以上含む吸水性材料44が90〜30重量%の混合物であって、坪量が20〜500g/m²にしてある。このウェブ20は搬送用無端ベルト21から走行中の賦型用無端ベルト23へ、その幅方向に一樣な量で供給する。ウェブ20には必要なら厚み方向に僅かな圧力を加え、地合いを安定させるが、その際、ウェブ20に少量の水を散布したうえで圧力を加えると、より確実に安定させることができる。ベルト23は所定温度の加熱炉24を通過し、その間に熱可塑性繊維43が軟化、または一部溶融して変形し、ピン22周りではその形状に倣う変形が生じる。加熱中にウェブ20の表面全体に僅かな面圧を作用させ、繊維43の熱変形を利用してウェブ20の厚みを均一にすることができる。繊維43が熱

巻縮性であるときは、この加熱炉24において巻縮を発現させる。加熱炉24を出たウェブ20は冷却して形状を安定させ、ピン22から抜き取って製品30とする。製品30はピン22の太さ、高さ、および位置に対応した開孔16を有するシート状物であり、ウェブ20の賦型用ベルト23への供給量、および必要に応じて作用させる面圧等により、その厚み・密度を規制することができる。開孔16はピン22の高さに比し、ウェブ20の供給量が多ければ盲孔となり、少なければ透孔となる。

【0020】ウェブ20に使用する熱可塑性繊維43の好ましい例はポリエチレンとポリプロピレンとの複合フィルムを割裂・短繊維化したスプリットヤーン、ポリエチレンとポリプロピレンとの芯鞘型複合繊維等の複合繊維である。加熱により巻縮させることが可能なこの複合繊維は、繊維交絡が密で形状の安定した表面吸収体17を得るのに有用である。熱可塑性繊維43の繊維長が5mm未満では充分な強度の表面吸収体17が得られず、100mmより長くなるとウェブ20をピン22周りに一樣に散布することが難しくなり、輪郭の整った開孔16が得られない。熱可塑性繊維43の使用量が、10%未満では吸収体17の強度が十分ではなく、一方70%を越えると表面吸収体17が硬くなりすぎる傾向にある。熱可塑性繊維43の一部または全部を親水化処理した熱可塑性繊維に替え、吸水性材料の一部を兼ねることも可能であるが、表面吸収体17において熱可塑性繊維が70重量%を越えると吸収体が硬くなりすぎることに加え、吸収体の保水力が低下するので好ましくない。ウレタンスポンジやセルローススポンジ等の海綿状高分子

は保水力は低いが吸水性があり、また表面吸収体17にクッション性を付与して局部へのなじみをよくする効果がある。

【0021】粉碎バルブ等の比較的繊維が短い親水性繊維と比較的繊維が長い熱可塑性繊維43との混合物であるウェブ20にあっては、短い繊維間に延在する熱可塑性繊維が短い繊維間の水分拡散性を向上させるという副次的な効果も得られる。表面シート2の透孔15はプラスチックシートや不織布に設けた平面的な孔である他に、表面シート2の表面から吸収体4に向って延出する導液管であってもよい。この場合の開孔面積は、導液管先端部の平面への投影面積である。

【0022】

【発明の効果】この発明に係る体液処理用品では、表面シートの透孔を通過した固形分を吸収体に設けた開孔に収容するから、固形分が表面シート上に残ったり、逆流したりすることが少なく、体液排泄後にも着用感を損なうことがない。

【0023】基板上に起立したピン周りに原料素材のウェブを供給、加熱して吸収体の開孔を形成すると、その開孔が透孔であるか盲孔であるかを問わず所要深さを容易に得ることができる。この方法であると、熱エンボスとは異なりウェブを局部的に加圧することがないから、得られる吸収体には密度や硬さのむらが生じ難く、原料素材の吸収性能、肌触りを損なうことが少ない。

【図面の簡単な説明】

【図1】この発明に係る体液処理用品を一部破断して示す斜視図。

【図2】吸収体の部分拡大斜視図。

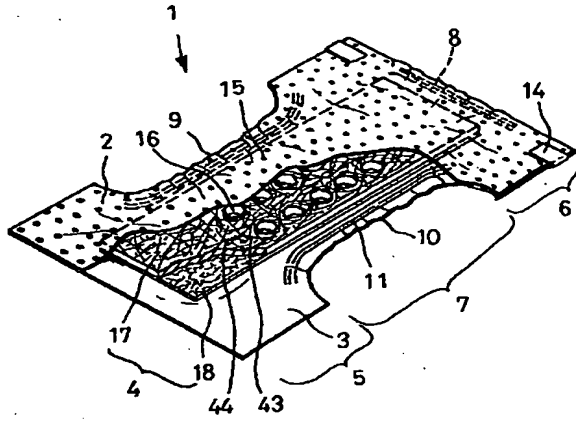
【図3】吸収体の模式的製造工程図。

【図4】賦型用無端ベルトの部分拡大斜視図。

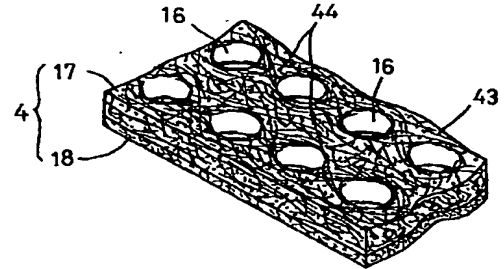
【符号の説明】

- 1 体液処理用品(使い捨ておむつ)
- 2 表面シート
- 3 裏面シート
- 4 吸収体
- 7 股下部位
- 15 透孔
- 16 開孔
- 17 吸収体(開孔吸収体)
- 18 吸収体(無開孔吸収体)
- 20 ウェブ
- 22 ピン
- 23 基板(賦型用無端ベルト)
- 24 加熱装置
- 43 熱可塑性繊維
- 44 吸水性材料

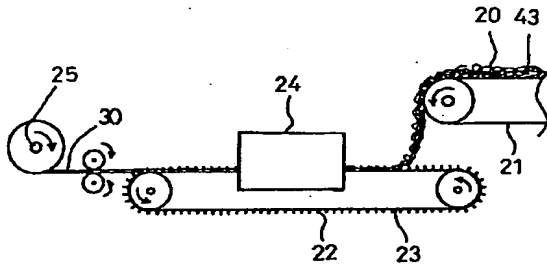
【図1】



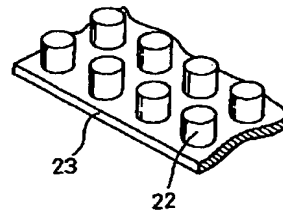
【図2】



【図3】



【図4】



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